IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Gupta *et al.*	§	Examiner: V. Balasubramanian
Serial No.: 09/964,919	§	Group Art Unit: 1624
Filed: September 27, 2001	§	Attorney Docket: 01005-00
For: Novel Red-Shifted Triazine Ultraviolet Light Absorbers	§	July 3, 2003

DECLARATION OF DR. RAM GUPTA UNDER 37 C.F.R. §1.132

I, Dr. Ram B. Gupta, do hereby state and declare that:

I am one of the listed inventors of the subject matter claimed in the above-identified application.

I received a Ph.D. degree in Organic Chemistry from Delhi University in 1979, and served as a Lecturer at Rajdhani College of Delhi University from 1979 to 1981. I conducted Postdoctoral research in synthetic organic chemistry at Fordham University and Hunter College (City University of New York) from 1981 to 1989. I provided research training and supervision assistance to seven (7) Ph.D. candidates at Delhi University and Hunter College through 1989.

I have a total of twenty-nine (29) years of academic and corporate research experience in synthetic organic chemistry. I have been employed by Cytec Industries Inc. (or a predecessor thereof) since 1989, and have been engaged in research in organic synthesis and characterization in the course of my employment. For the past seven (7) years, I have primarily conducted research in the area of UV absorbers and stabilizers. My current position is as a Research Fellow for the Polymer Additives Department of Cytec Industries Inc.

I have authored or co-authored thirty (30) research publications on several aspects of organic synthesis and characterization in various internationally recognized journals, and am an inventor or co-inventor on approximately forty (40) U.S. Patents.

I reviewed the present Final Office Action and U.S. Patent No. 3,118,887 to Hardy et al. (Hardy) that was cited against Claims 1 to 6 of the present application. It is my understanding that the Examiner contends that Hardy teaches the equivalency of mono and tris(2-hydroxynaphthyl)-triazines by the definition of X,Y and Z in Formula I at col.1, line 60. It is also my understanding that the Examiner contends that it would have been obvious to one skilled in the art to make mono(2-hydroxynaphthyl)-triazine based on the disclosure of tris(2-hydroxynaphthyl)-triazines (Example 8 in Hardy) and the procedure taught in Hardy at col. 2, line 64 to col. 3, line 13.

As discussed in my previous Declaration dated May 29, 2003, I directed the synthesis of tris(2-hydroxynaphthyl)-s-triazine similar to the procedure of Example 8 in Hardy. The resulting tris(2-hydroxynaphthyl)-s-triazine compound was crystallized from N,N-

dimethylformamide (DMF) and analyzed by liquid chromatograph-mass spectrometer (LCMS). In my previous Declaration, I compared the UV spectrum of the tris(2-hydroxynaphthyl)-triazine in Example 8 of Hardy to the mono(2-hydroxynaphthyl)-triazine compound in Example 3 of the present application. Each UV spectrum was measured in the same solvent and at the same concentration (1mg/100 mL THF) and using the same instrument. The comparison showed that the compound in Example 3 has significantly better absorbance and an absorbance maximum in the UV-B region, while the tris(2-hydroxynaphthyl)-triazine in Example 8 of Hardy had significantly less absorbance and an absorbance minimum in the UV-B region. This is surprising and unexpected based on the disclosure in Hardy. As mentioned in my previous Declaration, protection of the UV-B region is critical for several polymers, and human skin. In fact, several commercial UV absorbers used in cosmetic preparations are UV-B absorbers only (e.g., see U.S. Patent 6,129,908; column 1, lines 10-23).

In addition to the previously submitted UV absorbance data, I respectfully submit two other comparisons (Yellow index (YI) which measures inherent color and solubility data) that further support the superior and unexpected results of the present invention over Hardy.

Yellow Index

I directed the preparation of 100 ppm samples (10 mg/100 mL) in THF of the tris(2-hydroxynaphthyl)-triazine in Example 8 of Hardy and the mono(2-hydroxynaphthyl)-triazine compound in Example 3 of the present application. The YI was measured using a Liquid Color Spectrophotometer from BYK-Gardner USA. Duplicate measurements were made for each sample using 10 mm cuvettes. The comparison data is shown below. The higher the YI , the more color in the sample.

Sample	L	A	B	YI	YI Avg.
Example 8 (Hardy)	100.2	-12.1	23.1	32.94	32.94
Example 8 (Hardy)	100.2	-12.1	23.1	32.94	
Example 3 (Present)	100.4	-1.7	2.7	3.84	3.91
Example 3 (Present)	100.4	-1.7	2.8	3.98	

The results show that the tris(2-hydroxynaphthyl)-triazine in Hardy has approximately an order of magnitude more color than Example 3 of the present invention. Again, it should be noted that the concentrations of the samples were the same (100 ppm) in the same solvent (THF). As discussed in Hardy, a good ultraviolet absorber should impart no color to the composition (Hardy at col. 1, line 28). This data dramatically demonstrates that the UV absorbers of the present invention is significantly better with respect to imparting no color to the composition than the closest prior art UV absorber disclosed in Hardy.

Solubility

Solubility is also an important parameter for UV absorbers to be effective (Please see Hardy, U.S. Patent 3,118,887; column 1, lines 33-38). This is especially important for applications in cosmetic preparations (for example, see U.S. Patent 6,129,908; column 1, lines 44-51), coatings (for example, see U,S, Patent 5,786,477; column 1, lines 41-67 and column 2, lines1-5), and several polymers (for example, see U.S. Patent 3,896,125; column

1, lines 51-60). In general, if the compound is not soluble in common organic solvents that are typically used in the UV absorber art, they are unlikely to be useful as UV absorbers.

The solvents that are commonly used in the UV absorber art to gauge the solubility of UV absorber compounds include dichloromethane (methylene chloride), toluene, xylenes and butyl acetate. (For example, see U.S. Patent 5,786,477, column 1, lines 41-48). I directed the testing for solubility of the tris(2-hydroxynaphthyl)-triazine in Example 8 of Hardy and the mono(2-hydroxynaphthyl)-triazine compound in Example 3 of the present application in these solvents. The following table shows the approximate % solubility (g/mL X 100) in the solvents at ambient temperature (22-25°C). The tris(2-hydroxynaphthyl)-triazine had insignificant (or negligible) solubility in these solvents as shown in the following table.

SAMPLE	SOLVENT			
	METHYLENE - CHLORIDE	TOLUENE	XYLENES	BUTYL ACETATE
EXAMPLE 8 (HARDY)	0.01%	0.01%	0.01%	0.01%
EXAMPLE 3 (PRESENT)	20%	15%	10%	5%

This data demonstrates that the UV absorber of the present invention is significantly better with respect to solubility than the closest prior art UV absorber disclosed in Hardy. We also found that the UV absorber disclosed in Hardy failed to dissolve even in more polar solvents, viz., acetone, acetonitrile, tetrahydrofuran and methanol at as low as 0.1%, indicating that it has extremely poor solubility in a wide variety of commonly used, both polar and non-polar, organic solvents.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Ram B. Gupta

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Date: July 3rd, 2003